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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/054,687	01/22/2002	Thaddeus J. Gabara	Gabara 81-10-1-14	5163

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EXAMINER	
AGHDAM, FRESHTEH N	
ART UNIT	**PAPER NUMBER**
2611	
MAIL DATE	**DELIVERY MODE**
05/17/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/054,687	GABARA ET AL.	
	Examiner	Art Unit	
	Freshteh N. Aghdam	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 February 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,7-12 and 15-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4, 7-12 and 15-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 2/14/2007 have been fully considered but they are not persuasive.

Applicant's Argument(s): Regarding rejection of claims 16 and 17 under 35 U.S.C. 101 as being directed to non-statutory subject matter, page 7, applicant argues that the rejection is improper because the claimed invention is no longer directed to non-statutory subject matter. Regarding rejection of claims 16 and 17 under 35 U.S.C. 112, first paragraph, as to failing to comply with the written description requirement, pages 7-8, applicant argues "the Applicant did not add any new matter in the Applicant's last Amendment, but, in fact, deleted subject matter from the only specification paragraph that was amended," Regarding claim 1, page 8, applicant argues that the instant application's disclosed prior art does not disclose selecting a maximum combined probability for two or more transitions to the current state, but rather, a maximum probability for a single transition to the current state.

Examiner's Response: Regarding the first and second arguments set forth above, the examiner respectfully disagrees with the applicant because since the applicant is neither allowed to add any new matter to the specification nor to delete any subject matter from the specification, the non-statutory subject matter is still standing. Regarding the third argument set forth above, the examiner respectfully disagrees with the applicant because combination of the instant application's disclosed prior art and

Hayashi teach the claimed invention. The instant application's disclosed prior art discloses updating the forward probability for a state comprises selecting the maximum combined probability for transitions to the current state given by equations 8-9 (Pg. 3). And Hayashi discloses that the trellis diagram provides combined probabilities of transition from one or more states at k-N, N is an integer greater than 1, to current states at time k as the set of forward probabilities (Fig. 10; Col. 2, Lines 64-67; Col. 3, Lines 1-17).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4, 7-12, and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stephen et al (US 2002/0029362), further in view of Hayashi (US 5,600,664) and the instant application's disclosed prior art.

As to claims 1, 7, 9, and 16, Stephen teaches a maximum a posteriori (MAP) processor for detecting or decoding the encoded data comprising: retrieving a first block of samples and a corresponding set of forward probabilities, wherein the block of samples correspond to states of a merged trellis, wherein the merged trellis provides combined probabilities of transition from one or more states at k-1 to current states at time k as the set of forward probabilities; and updating the set of forward probabilities of

the merged trellis for the current state at time k based on the block of samples and the corresponding set of forward probabilities (Fig. 18; Par. 54, 71-77,190, and 223). Stephen is silent about the trellis diagram provides combined probabilities of transition from one or more states at k-N, N is an integer greater than 1, to current states at time k as the set of forward probabilities; and wherein updating the forward probability for a state comprises selecting the maximum combined probability for transitions to the current state given

by

$$A_j^k = \max^*_{i=0,1,\ldots,7}(A_i^{k-N} + \tilde{\Gamma}_{i,j}^k) \text{ for } j=0,1,\ldots,M-1,$$

where $\tilde{\Gamma}_{i,j}^k$ is the combined probability obtained by adding N individual branch matrices from time k–N to time k in an original trellis, and M is the number of states

Hayashi teaches that the trellis diagram provides combined probabilities of transition from one or more states at k-N, N is an integer greater than 1, to current states at time k as the set of forward probabilities (Fig. 10; Col. 2, Lines 64-67; Col. 3, Lines 1-17). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Hayashi with Stephen in order to reduce the amount of calculation and memory required in the decoding process. The instant application's disclosed prior art teaches updating the forward probability for a state comprises selecting the maximum combined probability for transitions to the current state given by equations using the maximum probability to calculate one or more log likelihood values in a maximum a posteriori (MAP) processor for one or more blocks of samples

corresponding to the data and detecting or decoding the encoded data using the one or more log likelihood values (Eq. 8-9 (Pg. 3). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of the instant application's disclosed prior art with Stephen and Hayashi in order to recover the transmitted signal in an efficient manner by utilizing the MAP algorithm.

As to claims 2, 10, and 17, Stephen teaches retrieving a second block of samples and a corresponding set of backward probabilities, wherein the samples correspond to states of the merged trellis, wherein the merged trellis provides cumulative probabilities of transition from one or more states at time k+1 to current states at time k as the set of backward probabilities; and updating the set of backward probabilities of the merged trellis for the current state at time k based on the block of samples and the corresponding set of backward probabilities, wherein the computation of the backward probabilities are similar to the forward probabilities (Par. 71-77 and 190). Stephen is silent about the trellis provides combined probabilities of transition from one or more states at k+N, N is an integer greater than 1, to current states at time k as the set of forward probabilities. Hayashi teaches that the trellis diagram provides combined probabilities of transition from one or more states at k-N, N is an integer greater than 1, to current states at time k as the set of forward probabilities (Fig. 10; Col. 2, Lines 64-67; Col. 3, Lines 1-17). One of ordinary skill in the art would clearly recognize that it is obvious to obtain the backward probabilities the same way as the forward probabilities. Therefore, it would have been obvious to one of ordinary skill in

the art to combine the teaching of Hayashi with Stephen in order to reduce the amount of calculation and memory required in the decoding process.

As to claims 3 and 11,the instant application's disclosed prior art discloses computing log likelihood values from the updated forward and backward probabilities and generating a data sequence for one or more blocks of samples corresponding to the log likelihood values (Pg. 3, Eq. 7). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of the instant application's disclosed prior art with Stephen and Hayashi in order to recover the transmitted signal in an efficient manner by utilizing the reliability information.

As to claims 4 and 12, Stephen teaches storing in or reading from a memory each block of sample values for each updating (Par. 90, 164, 165, and 190).

As to claims 8 and 15, Stephen, Hayashi, and the instant application's disclosed prior art teach all the subject matter claimed in claims 1 and 9, except for the MAP processor to be implemented by a processor in an integrated circuit. One of ordinary skill in the art would clearly recognize that employing an integrated circuit, as a processor is well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art to employ an integrated circuit as a processor in order to reduce size of a device and save space.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Freshteh N. Aghdam whose telephone number is 571-272-6037. The examiner can normally be reached on 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571-272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Freshteh Aghdam
Examiner
Art Unit 2611

May 11, 2007

KEVIN BURD
PRIMARY EXAMINER